

WILD TURKEY POULT PRODUCTION SURVEY

2009

Wild turkey brood surveys are valuable for examining population trends in various forest habitat regions of the state. These brood surveys are used to monitor poults per hen (PPH) which serves as an index to annual production. Prior to 1994, there were no statewide organized observations or recordings of wild turkey recruitment. As a result, there were only educated guesses based on weather patterns and casual observations. Beginning in 1994, the first standardized statewide survey was developed and implemented by Louisiana Department of Wildlife and Fisheries (LDWF), Wildlife Division personnel.

METHODS

Survey Procedure

In Louisiana, the primary breeding and egg laying period occurs from late March to mid-April. Most mortality among turkey poults occurs during the first 3 weeks of their lives. With this in mind, 1 July - 31 August was selected for the poult survey (a period when poults should be four weeks or older in age). As such, most poults that are observed during the survey should be alive during the spring hunting season. During July and August, Wildlife Division personnel and other selected individuals record the number of hens, poults, and gobblers observed. Date, parish, and/or Wildlife Management Area where the observation is made are also recorded. Observations are usually made incidentally to the routine activities of the observer.

Study Area

The state is divided along parish lines into 5 regions based largely on historic habitat/geological regions (Figure 1).

Northwest Loblolly/Shortleaf/Hardwood

Bienville, Bossier, Caddo, Caldwell, Claiborne, DeSoto, Jackson, LaSalle, Lincoln, Red River, Union, and Webster parishes are included in this region. Wild turkeys are found throughout this region with the highest populations located in Bienville, Claiborne, Jackson, Lincoln, Union, and Webster parishes. Coastal Plain, Flatwoods, and Recent Alluvium soil areas are found in this region. These include soils with permeable and moderately permeable subsoils in the rolling hills area of the Coastal Plain, poorly drained forested soils in the Flatwoods areas, and alluvial soils derived from the Red and Mississippi rivers in the recent alluvium forest habitat. There are 4,000,000 acres of forested habitat in this region, and 270,000 (6.8%) are publicly owned. General forest habitats consist of Loblolly/Shortleaf pine and Oak-Hickory. Loblolly pine is the dominant commercial tree species in this region.

North Mississippi Delta

Catahoula, Concordia, East Carroll, Franklin, Madison, Morehouse, Ouachita, Richland, Tensas and West Carroll parishes comprise this region. Soil types found in this area are of the Recent Alluvium group which consists of silty and sandy soils of the Mississippi River in the better drained areas, clayey recent alluvial soils of the Mississippi River in the poorly drained areas, and alluvial soils derived from older sediments of the Arkansas and Ouachita rivers. Timber types consist mainly of bottomland hardwood and cypress and 199,000 (16.4%) of the 1,211,000 acres are publicly owned. Management of the remaining timber varies from select

cutting to clear cutting. Much of the turkey habitat in this region was lost during the 1960s - 1980s due to conversion to agriculture. Turkey populations are highest in the wooded habitat portions of Concordia, Madison and Tensas parishes.

Western Longleaf Pine

Allen, Beauregard, Calcasieu, Evangeline, Grant, Jefferson Davis, Natchitoches, Rapides, Sabine, Vernon and Winn parishes are included in this region. Soils located in this region are of the Coastal Plains, Mississippi Terrace and Loessial Hills, Flatwoods, Coastal Prairies, and Recent Alluvium types. The Coastal Plains soils have permeable to moderately permeable subsoils in gently rolling areas. The Flatwoods consist of the poorly drained forested soils, while the Coastal Prairie areas consist of prairie soils with very slowly permeable subsoils. The Recent Alluvium soil area was derived from the older and recent sediments of the Mississippi and Red rivers. Historically, the major timber type was longleaf pine, but more recent timber practices have converted this area to loblolly pine plantations. Approximately 600,000 acres (13.0%) of the 4,593,000 of forested habitat are publicly owned. The U. S. Forest Service owns about 500,000 acres, and its long-range plans are to convert 50% of their acreage to longleaf pine. Bottomland hardwoods and cypress are found in the Recent Alluvium soils areas. Wild turkey populations have done very well in all parishes in this region except in the parishes of Jefferson Davis and Evangeline. Lack of a suitable habitat is believed to be the main reason for lack of or low populations in these parishes.

Atchafalaya and South Mississippi Delta

Ascension, Assumption, Avoyelles, Cameron, Iberia, Iberville, Jefferson, Lafayette, Lafourche, Orleans, Plaquemines, Pointe Coupee, St. Bernard, St. Charles, St. James, St. Landry, St. Martin, St. Mary, Terrebonne, Vermilion and West Baton Rouge parishes are included in this region; however, coastal parishes do not provide turkey habitat. Soils in this area are mainly in the Recent Alluvium group. These include areas of silty and sandy recent alluvial soils of the Mississippi River which occur in the better drained areas and alluvial soils derived from older and recent sediments of the Mississippi and Red rivers. Forest types include bottomland hardwoods and cypress. Forested habitat totals 2,056,000 acres of which 128,000 acres (6.2%) are publicly owned. Clear cutting and select cutting are the harvest procedures usually used. Parishes with best turkey populations include Avoyelles, Iberville, Pointe Coupee, St. Landry and West Baton Rouge.

Southeast Loblolly Pine

East Baton Rouge, East Feliciana, Livingston, St. Helena, St. Tammany, Tangipahoa, Washington and West Feliciana parishes comprise this region. Soils found in this area are of the Coastal Plains, Flatwoods, and Mississippi Terrace and Loessial Hills groups. Dominant forest types include loblolly pine and both upland and bottomland hardwoods. This region has the smallest public ownership of the 5 habitat regions. Only 59,000 (3.1%) of the 1,932,000 acres are publicly owned. The majority of the forested habitats are managed for pine production. All parishes in the Southeast Loblolly region have turkey, but the number of birds varies greatly, even within a parish, due to habitat conditions.

Production Assessment

All Wildlife Management Area data were recorded by parish and included in the

regional analysis. Poult per hen (PPH) were calculated as the number of poult divided by the number of hens observed for analysis unit. If an observer recorded poult but no hens, 1 hen was assigned to that observation. An analysis of covariance was conducted using PROC MIXED to determine differences among habitats and using Contrast statements in SAS. PROC GLM in SAS was used to determine differences among years and within habitat using Waller-Duncan K-ratio. Graphics use simple SE calculations for determination of confidence intervals. Observations with neither poult nor hens were not included in the PPH calculations. For our purposes, we ranked production into 5 categories: 1) excellent-4.0 PPH or higher, 2) very good-3.3 - 3.9 PPH, 3) good- 2.6 - 3.2 PPH , 4) fair - 2.0- 2.5 PPH, or 5) poor- below 2.0 PPH (adapted from pers. comm. Southeast Wild Turkey Technical Committee). No statewide values are reported because of differences in acreage, number of observations, and production among habitat types. However, relative production for years was determined by ranking PPHs within habitats between 1 and 16 (1 being highest) and summed. Years with lower values suggested better production.

RESULTS AND DISCUSSION

2009 Production

During 1 July – 31 August 2009, 371 observations were recorded and used to determine PPH ratios. Differences in the PPH index were observed among some habitat regions ($P \leq 0.20$) (Table 1).

Table 1. Poult per hen (PPH) by habitat region, 2009.

Habitat Region	No. Observations	PPH Ratio	Ranking ^a	1994 -2008 PPH Average
NW Lob/Sh/Hdwood	69	1.6	A	3.2
SE Loblolly Pine	91	2.5	A	2.4
W Longleaf Pine	125	2.8	A B	3.8
N Mississippi Delta	40	1.7	B C	3.7
Atch /S L Miss Delta	46	2.3	C	2.7

^a PPH Ratios with the same letter are not different ($P \leq 0.20$)

The 2009 Summer Wild Turkey Survey indicates a continuation of below average poult production over much of Louisiana. As in 2008, four of five habitat regions in 2009 had PPH ratios below their 15-year average. *Southeast Loblolly Pine*, the region with the lowest long-term production average, was the only habitat unit with above average (slightly) numbers (PPH 2.5). This area has had above average hatches four out of the last five years, an indication of modest but stable production. *Northwest Loblolly/Shortleaf/Hardwood* had the lowest production ratio (PPH 1.6) in 16 years. This poor production parallels trends from similar adjacent habitat in Arkansas, where poult surveys indicate seven consecutive below average hatches. *Western Longleaf Pine* had the highest regional production at 2.8 PPH. This is characterized as a “good” hatch, but it is still below average for the habitat unit with the state’s best long-term production ratio. With only poor to fair hatches, North Mississippi Delta (1.7 PPH) and Atchafalaya and South Mississippi Delta (2.3 PPH) improved production somewhat over last year’s flood induced record low hatches of less than one poult produced per hen.

On a statewide basis, 2009 ranks (along with 2008 and 2004 as one of the three lowest production indexes observed during the 16-year period records have been maintained (Table 2). (Cumulative 1994-2009 data are summarized in Appendices 1-8.)

Table 2. Statewide production ranking by year for the period 1994-2009

Rank and Sum Method ^a	
Year	Sum
1999	14
1996, 1997, 1998	29
2005	34
2002	38
2001	39
1995	41
2003	42
1994	43
2000	45
2006, 2007	56
2004, 2009	59
2008	60

^a Lower values suggest better production.

Many interacting variables determine nesting success and poult survival each year. Among the most important are weather, predator population and habitat quality. Of these, only the weather can be quantified and accurately compared from year to year.

Wild turkey production in Louisiana is thought to be influenced by weather conditions during two critical phases of the reproductive cycle -- nest incubation and brood rearing. Hens incubate eggs from mid-April to early-June. Below normal spring rainfall produces favorable conditions for successful hatching. Conversely, wet weather during incubation seems to be associated with low productivity.

Good brood rearing conditions occur when rainfall is normal or above normal during mid-June through August. Wet conditions promote lush ground-level vegetation that provides escape cover for poults and fosters development of high insect populations. Protein-rich insects are the primary food of developing poults.

Table 3. Rainfall totals, expressed as a percentage of normal for habitat regions, April – August, 2009.

Month	SE Loblolly Pine	S Atch /L Miss Delta ^a	W Longleaf Pine ^a	NW Lob/Sh/Hdwood ^a	N Mississippi Delta ^a
April	48%	30% - 83%	130% - 173%	70% - 89%	44% - 152%
May	51%	56% - 71%	47% - 68%	134% - 140%	72% - 145%
June	22%	35% - 38%	22% - 27%	21% - 33%	22% - 28%
July	89%	91% - 101%	114% - 157%	152% - 242%	144% - 160%
August	98%	70% - 95%	83% - 85%	92% - 95%	44% - 142%

^a Range is provided because of overlap of weather data regions with physiographic regions used for this survey

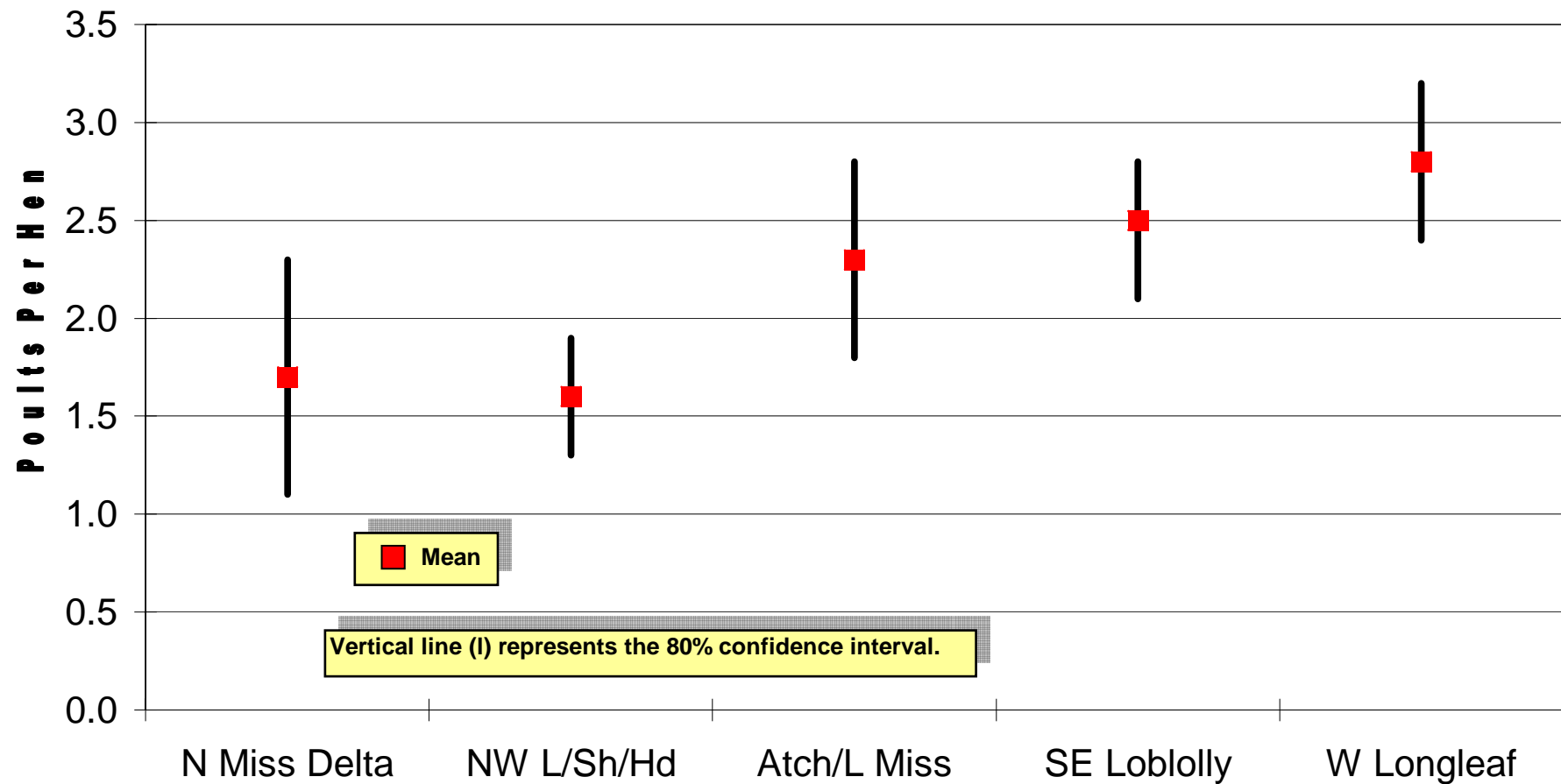
Rainfall during the 2009 nesting season was variable across the state (Table 3). Low April and May rainfall in the SE Loblolly and Atchafalaya/South Mississippi Delta habitat regions provided the best conditions for successful hatches. The other three regions suffered periods of above average rainfall during critical incubating and hatching periods.

Note: PPH values represent an average across a broad region. There will be areas within a region that had higher or lower production than the regional average. Factors such as habitat quality and local weather events may influence production in a specific area.

Figure 1

Figure 2

Turkey Production Index 2009



Appendices 1 – 8

Wild Turkey Poult Survey Data, 1994 – 2009

Appendix 1. Average poult per hen (PPH) by habitat/region for the period 1994-2009.

Habitat/Region	16 -Year Mean Poults Per Hen	Comparisons ^a
W Longleaf Pine	3.4	A
N Mississippi Delta	3.2	B
NW Lob/Sh/Hdwood	3.0	B
S Atch/L Mississippi Delta	2.5	C
SE Loblolly Pine	2.4	C

^a Values within a Habitat/Region with the same letter are not different at $P \leq 0.20$.

Appendix 2. Poults per hen (PPH) by year and habitat for the period 1994-2009.

Year	Habitat/Region	Poults Per Hen	Comparisons ^a
1994	W Longleaf Pine	4.2	A
	SE Loblolly Pine	3.8	A
	S Atch/L Miss Delta	2.6	B
	NW Lob/Sh/Hdwood	1.7	B C
	N Mississippi Delta	1.5	C
1995	W Longleaf Pine	4.5	A
	S Atch/L Miss Delta	4.4	A
	N Mississippi Delta	3.6	A B
	NW Lob/Sh/Hdwood	2.8	A B
	SE Loblolly Pine	1.6	C
1996	NW Lob/Sh/Hdwood	5.1	A
	W Longleaf Pine	4.8	A
	S Atch/L Miss Delta	3.1	B
	N Mississippi Delta	2.8	B
	SE Loblolly Pine	2.4	B
1997	W Longleaf Pine	4.8	A
	N Mississippi Delta	4.3	A
	NW Lob/Sh/Hdwood	3.3	B
	SE Loblolly Pine	3.0	B
	S Atch/L Miss Delta	2.2	C
1998	N Mississippi Delta	5.2	A
	S Atch/L Miss Delta	3.9	A
	NW Lob/Sh/Hdwood	3.9	A
	W Longleaf Pine	3.7	A
	SE Loblolly Pine	1.8	B
1999	N Mississippi Delta	5.2	A
	S Atch/L Miss Delta	5.1	A
	W Longleaf Pine	5.0	A
	NW Lob/Sh/Hdwood	4.0	A
	SE Loblolly Pine	2.7	B
2000	N Mississippi Delta	4.0	A
	NW Lob/Sh/Hdwood	3.9	A
	W Longleaf Pine	2.8	B
	S Atch/L Miss Delta	2.5	B C
	SE Loblolly Pine	1.9	C

Appendix 2 cont'd. Poults per hen (PPH) by year and habitat for the period 1994-2008.

Year	Habitat/Region	Poults Per Hen	Comparisons ^a
2001	N Mississippi Delta	7.0	A
	W Longleaf Pine	3.9	B
	NW Lob/Sh/Hdwood	3.4	B
	S Atch/L Miss Delta	2.1	B C
	SE Loblolly Pine	2.0	C
2002	W Longleaf Pine	5.7	A
	N Mississippi Delta	5.4	A
	NW Lob/Sh/Hdwood	2.5	B
	SE Loblolly Pine	2.3	B
	S Atch/L Miss Delta	1.9	B
2003	N Mississippi Delta	4.6	A
	W Longleaf Pine	4.2	A
	NW Lob/Sh/Hdwood	3.0	B
	SE Loblolly Pine	2.6	B
	S Atch/L Miss Delta	1.2	C
2004	NW Lob/Sh/Hdwood	3.6	A
	N Mississippi Delta	2.7	B
	W Longleaf Pine	1.9	C
	S Atch/L Miss Delta	1.6	C D
	SE Loblolly Pine	1.2	D
2005	S Atch/L Miss Delta	3.5	A
	W Longleaf Pine	3.5	A
	NW Lob/Sh/Hdwood	3.3	A
	N Mississippi Delta	3.0	A
	SE Loblolly Pine	2.9	A
2006	W Longleaf Pine	3.0	A
	S Atch/L Miss Delta	2.6	A B
	SE Loblolly Pine	2.3	B
	N Mississippi Delta	2.2	B
	NW Lob/Sh/Hdwood	2.2	B
2007	N Mississippi Delta	3.0	A
	SE Loblolly Pine	2.6	A B
	NW Lob/Sh/Hdwood	2.3	B
	W Longleaf Pine	2.3	B
	S Atch/L Miss Delta	2.2	B
2008	NW Lob/Sh/Hdwood	2.9	A
	SE Loblolly Pine	2.8	A
	W Longleaf Pine	2.5	A
	N Mississippi Delta	0.9	B
	S Atch/L Miss Delta	0.8	B
2009	W Longleaf Pine	2.8	A
	SE Loblolly Pine	2.5	A
	S. Atch/L Miss Delta	2.3	A B
	N Mississippi Delta	1.7	B C
	NW Lob/Sh/Hdwood	1.6	C

^a Values within a Habitat/Region with the same letter are not different at $P \leq 0.20$

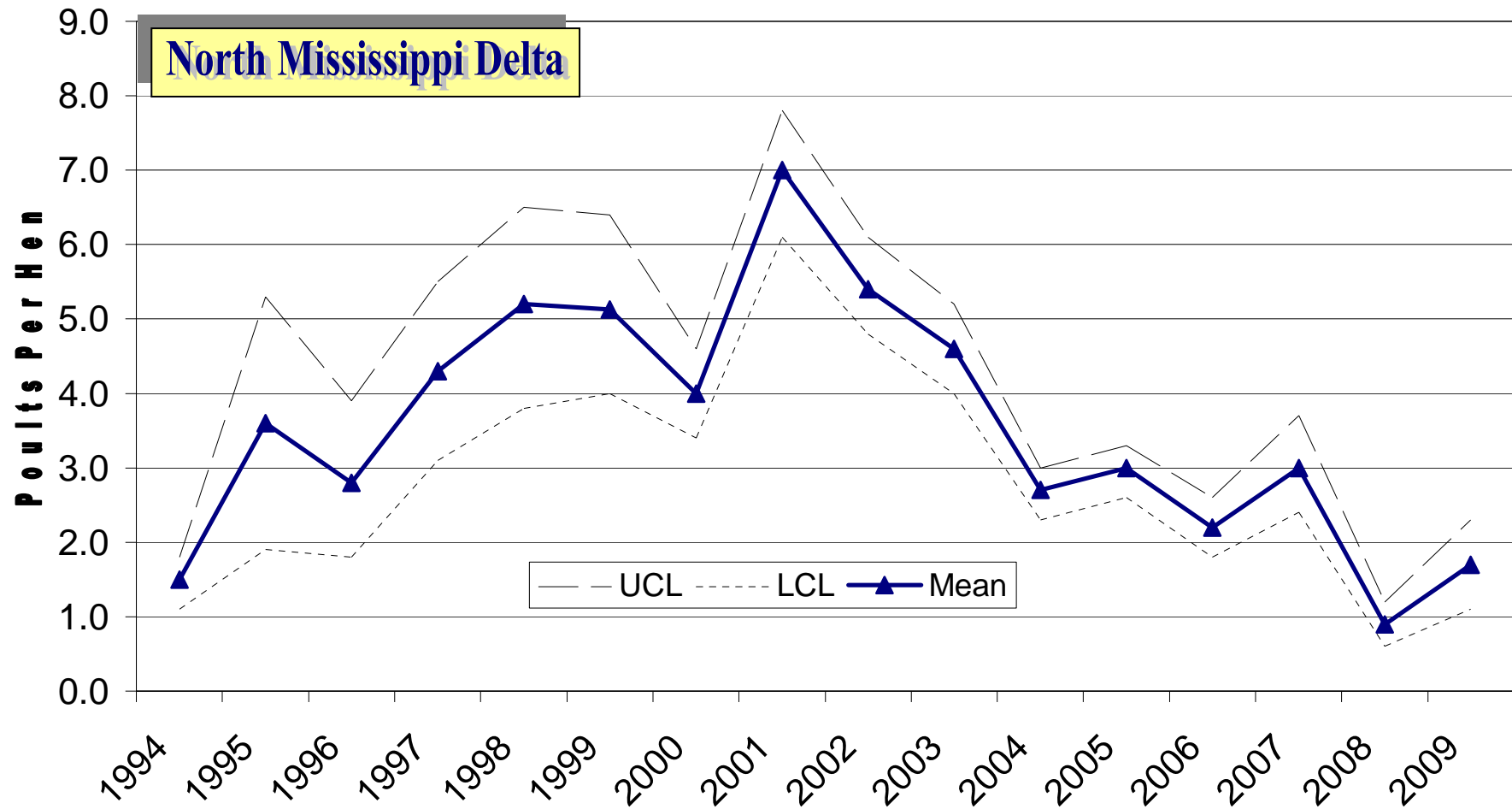
Appendix 3. Turkey production indices by habitat region and year.

North Mississippi River Delta									
Year	Index								
2001	7.0	A ^a							
2002	5.4		B						
1999	5.2		B	C					
1998	5.2		B	C					
2003	4.6		B	C	D				
1997	4.3			C	D				
2000	4.0				D	E			
1995	3.6				D	E	F		
2007	3.0					E	F	G	
2005	3.0					E	F	G	
1996	2.8					E	F	G	H
2004	2.7						F	G	H
2006	2.2							G	H
2009	1.7								H I
1994	1.5								I
2008	0.9								I
Northwest Loblolly/Shortleaf/Hardwood									
Year	Index								
1996	5.1	A							
1999	4.0		B						
2000	3.9		B						
1998	3.9		B						
2004	3.6		B	C					
2001	3.4		B	C					
1997	3.3		B	C	D				
2005	3.3		B	C	D				
2003	3.0			C	D	E			
2008	2.9			C	D	E			
1995	2.8			C	D	E			
2002	2.5				D	E	F		
2007	2.3					E	F	G	
2006	2.2					E	F	G	
1994	1.7						F	G	
2009	1.6							G	
Atchafalaya and S. Mississippi River Delta									
Year	Index								
1999	5.1	A							
1995	4.4	A	B						
1998	3.9	A	B	C					
2005	3.5		B	C	D				
1996	3.1			C	D	E			
2006	2.6				D	E	F		
1994	2.6				D	E	F		
2000	2.5				D	E	F		
2009	2.3				D	E	F	G	

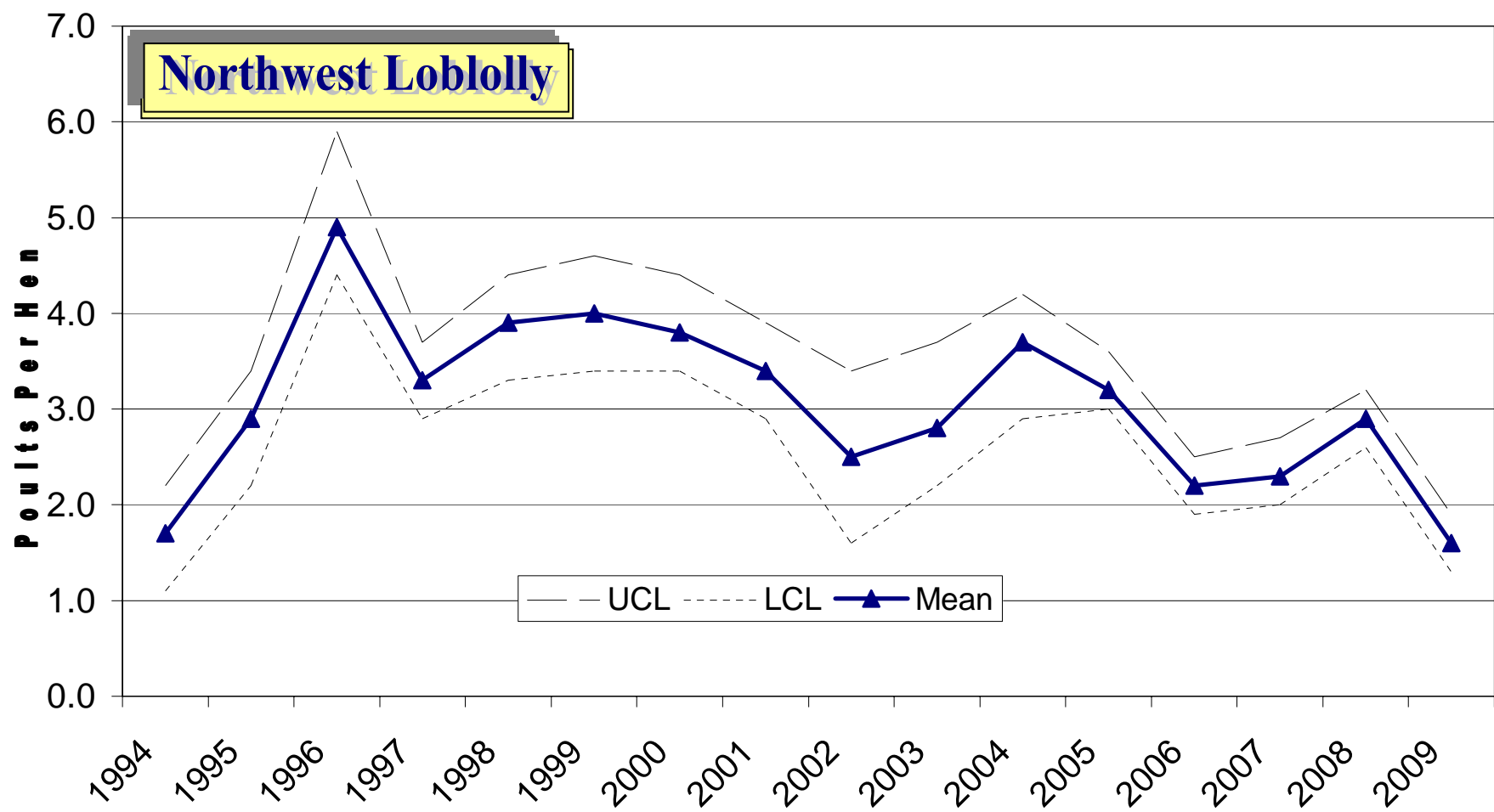
1997	2.2				E	F	G		
2007	2.2				E	F	G		
2001	2.1				E	F	G		
2002	1.9					F	G	H	
2004	1.6					F	G	H	
2003	1.2						G	H	
2008	0.8							H	
Southeast Loblolly									
<u>Year</u>	<u>Index</u>								
1994	3.8	A							
1997	3.0	A	B						
2005	2.9	A	B	C					
2008	2.8	A	B	C					
1999	2.7	A	B	C					
2003	2.6		B	C	D				
2007	2.6		B	C	D				
2009	2.5		B	C	D				
1996	2.4		B	C	D	E			
2006	2.3		B	C	D	E			
2002	2.2		B	C	D	E			
2001	2.0		B	C	D	E			
2000	1.9			C	D	E			
1998	1.8			C	D	E			
1995	1.6				D	E			
2004	1.2					E			
Western Longleaf Pine									
<u>Year</u>	<u>Index</u>								
2002	5.7	A							
1999	5.0	A	B						
1996	4.8	A	B	C					
1997	4.8		B	C					
1995	4.5		B	C	D				
2003	4.2		B	C	D	E			
1994	4.2		B	C	D	E			
2001	3.9			C	D	E	F		
1998	3.7				D	E	F	G	
2005	3.5					E	F	G	H
2006	3.0						F	G	H
2009	2.8							G	H
2000	2.8								H
2008	2.5								H
2007	2.3								I
2004	1.9								J

^a Values within a Habitat/Region with the same letter are not different at $P \leq 0.20$

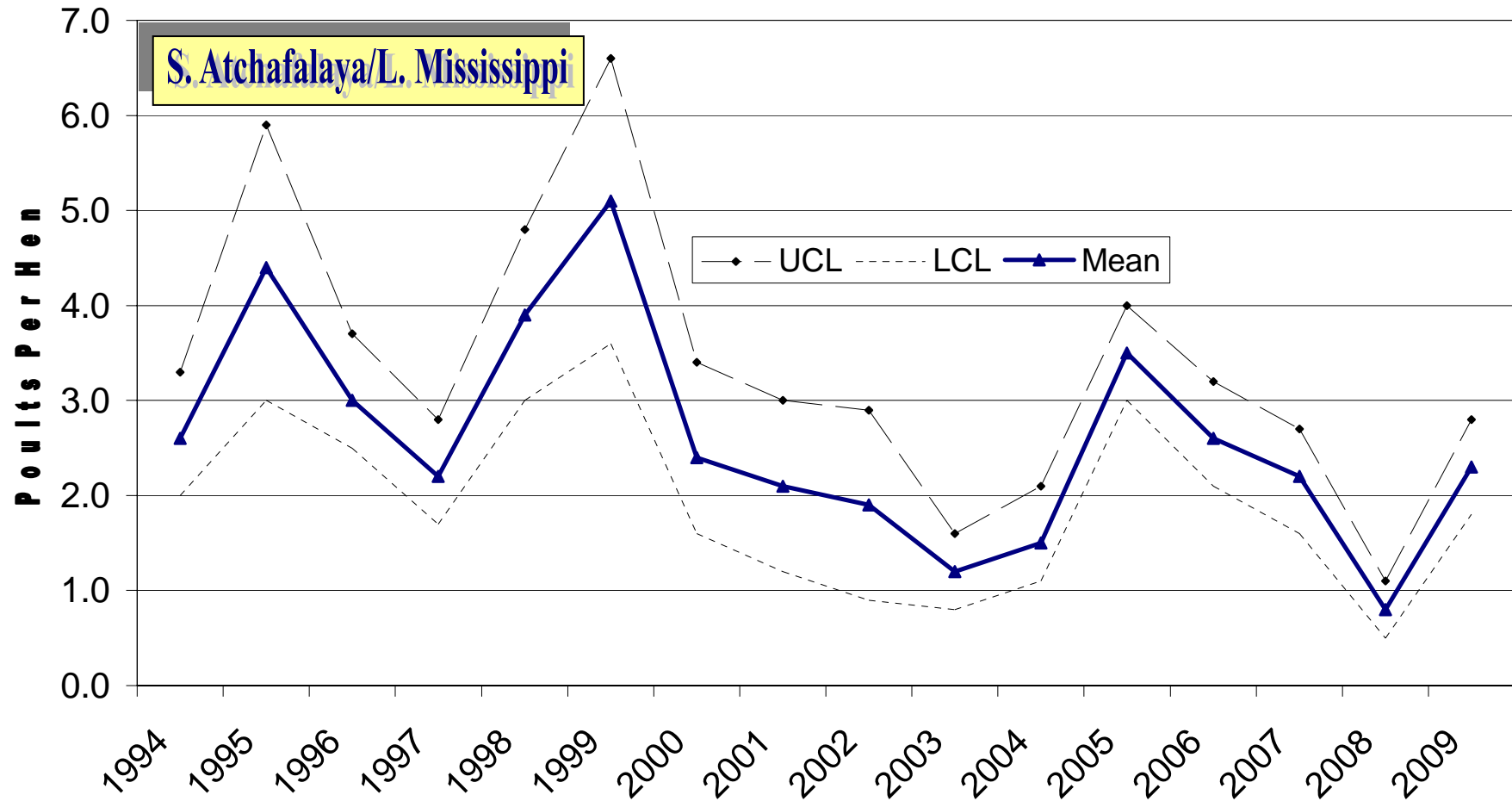
Turkey Production Index



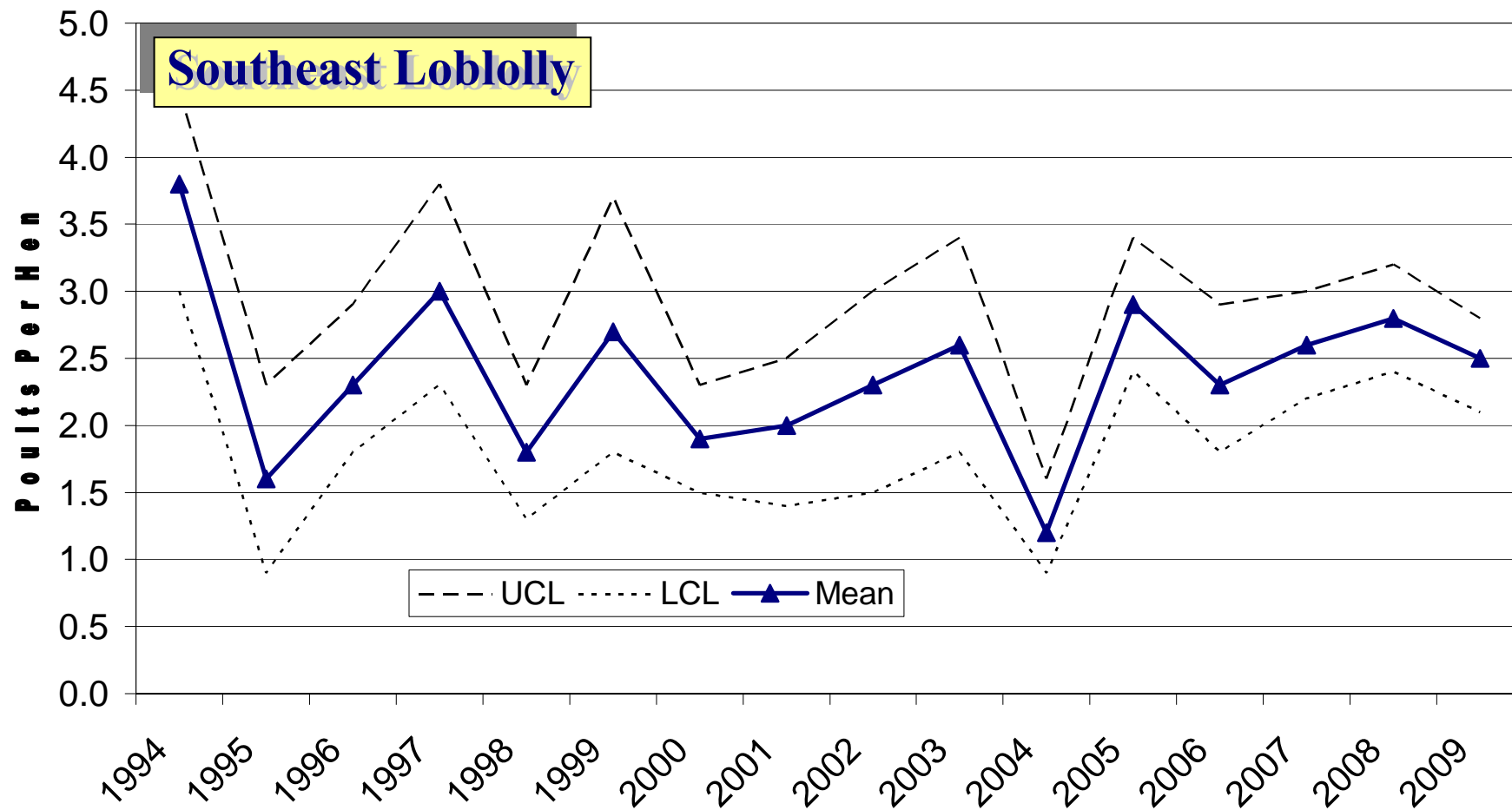
Turkey Production Index



Turkey Production Index



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